

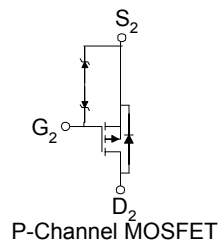
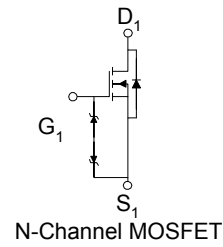
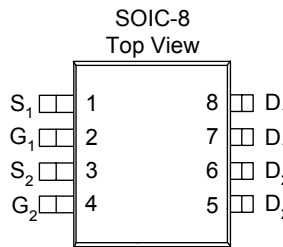
**P & N-Channel 30-V (D-S) MOSFET**

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $r_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low  $r_{DS(on)}$  provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOIC-8 saves board space
- Fast switching speed
- High performance trench technology



PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ m( $\Omega$ )	$I_D$ (A)
30	20 @ $V_{GS} = 4.5V$	8.4
	16 @ $V_{GS} = 10V$	10.0
-30	33 @ $V_{GS} = -4.5V$	-6.8
	23 @ $V_{GS} = -10V$	-8.5



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	N-Channel	P-Channel	Units	
Drain-Source Voltage	$V_{DS}$	30	-30	V	
Gate-Source Voltage	$V_{GS}$	20	-25		
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A=25^\circ C$	10	-8.5	A
		$T_A=70^\circ C$	8.1	-6.8	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	$\pm 50$	$\pm 50$		
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	2.3	-2.1	A	
Power Dissipation <sup>a</sup>	$P_D$	$T_A=25^\circ C$	2.1	2.1	W
		$T_A=70^\circ C$	1.3	1.3	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$		-55 to 150	$^\circ C$	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Maximum	Units	
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	62.5	$^\circ C/W$	
	Steady State	110	$^\circ C/W$	

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

**SPECIFICATIONS (T<sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
<b>Static</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 uA	N	30			V
		V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 uA	P	-30			
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 uA	N	1			V
		V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250 uA	P	-1			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0 V	P			±10	uA
		V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V	N			±10	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V	P			-1	uA
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V	N			1	
On-State Drain Current <sup>A</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	N	20			A
		V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -10 V	P	-50			
Drain-Source On-Resistance <sup>A</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A	N			16	mΩ
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 8.4 A				20	
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -8.5 A	P			23	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -6.8 A				33	
Forward Transconductance <sup>A</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 10 A	N		40		S
		V <sub>DS</sub> = -15 V, I <sub>D</sub> = -9.5 A	P		31		
Pulsed Source Current (Body Diode) <sup>A</sup>	I <sub>SM</sub>				5		A
<b>Dynamic</b>							
Total Gate Charge	Q <sub>g</sub>	N-Channel V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A P-Channel V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	N		12		nC
			P		13		
Gate-Source Charge	Q <sub>gs</sub>		N		3.3		
			P		5.8		
Gate-Drain Charge	Q <sub>gd</sub>		N		4.5		
			P		12		
<b>Switching</b>							
Turn-On Delay Time	t <sub>d(on)</sub>	N-Chaneel V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =1A , R <sub>GEN</sub> =25Ω, P-Channel V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-1A R <sub>GEN</sub> =15Ω	N		20		nS
			P		15		
Rise Time	t <sub>r</sub>		N		9		
			P		16		
Turn-Off Delay Time	t <sub>d(off)</sub>		N		70		
			P		62		
Fall-Time Notes	t <sub>f</sub>	N		20			
		P		46			

- a. Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

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### Typical Electrical Characteristics (P-Channel)

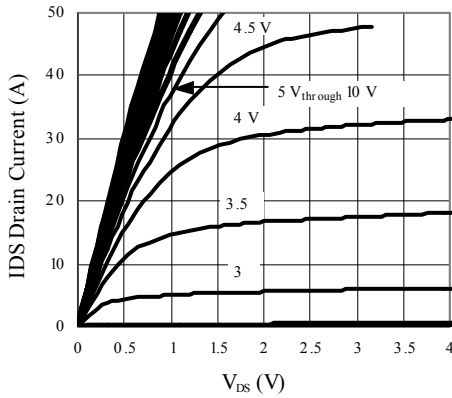


Figure 1. On-Region Characteristics

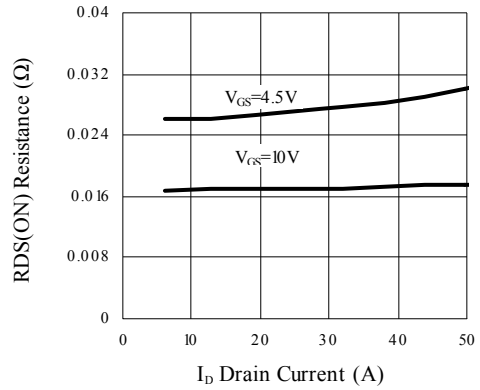


Figure 2. On-Resistance with Drain Current

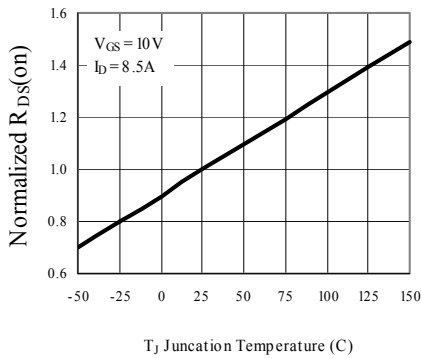


Figure 3. On-Resistance Variation with Temperature

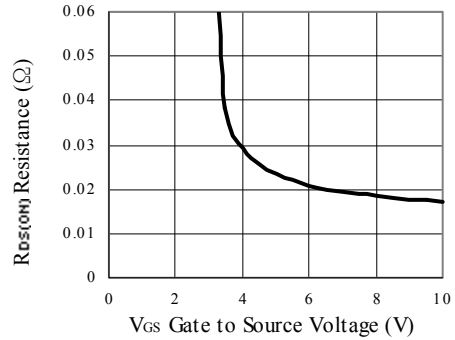


Figure 4. On-Resistance Variation with Gate to Source Voltage

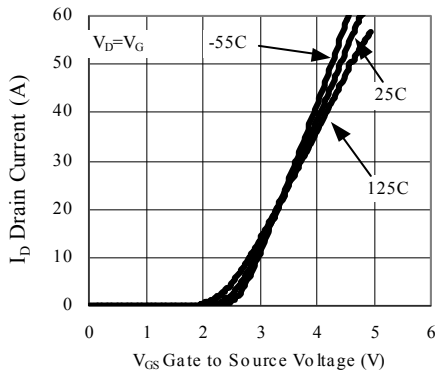


Figure 5. Transfer Characteristics

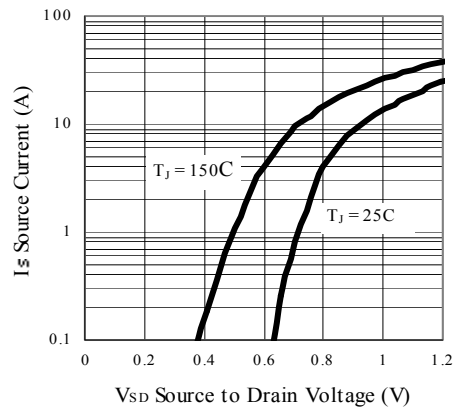


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics (P-Channel)

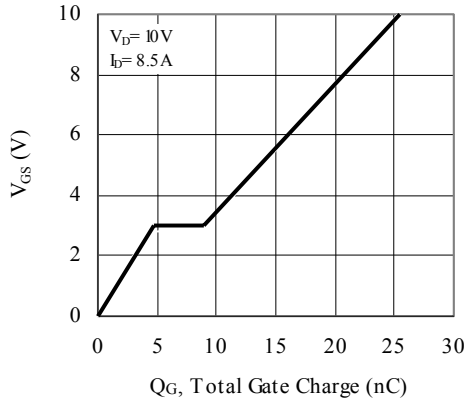


Figure 7. Gate Charge Characteristics

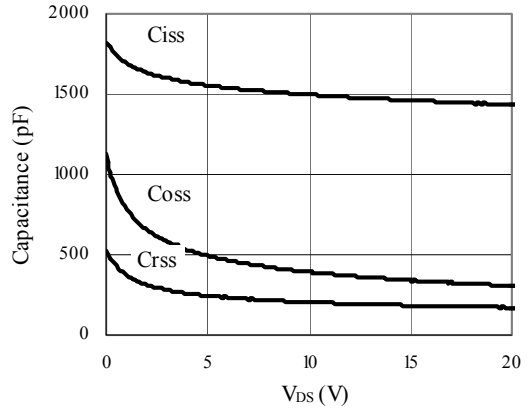


Figure 8. Capacitance Characteristics

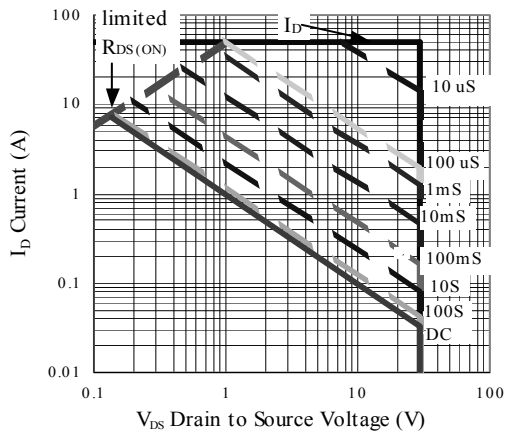


Figure 9. Maximum Safe Operating Area

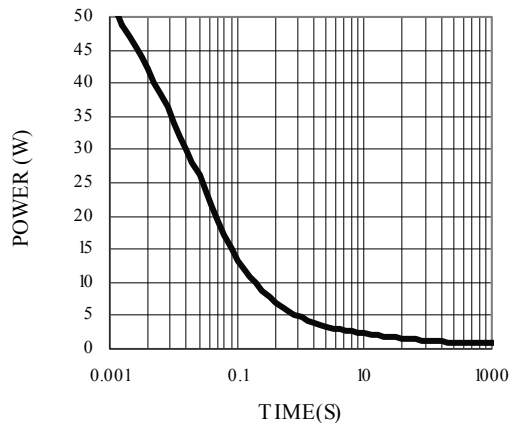


Figure 10. Single Pulse Maximum Power Dissipation

### Normalized Thermal Transient Junction to Ambient

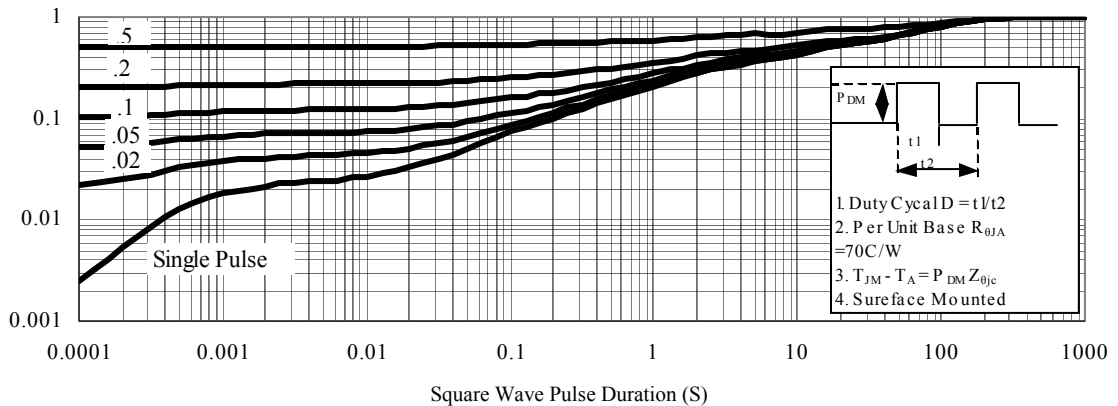


Figure 11. Transient Thermal Response Curve

### Typical Electrical Characteristics (N-Channel)

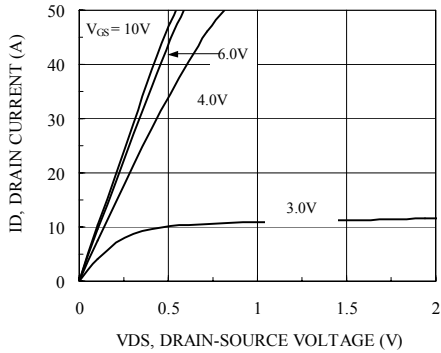


Figure 1. On-Region Characteristics

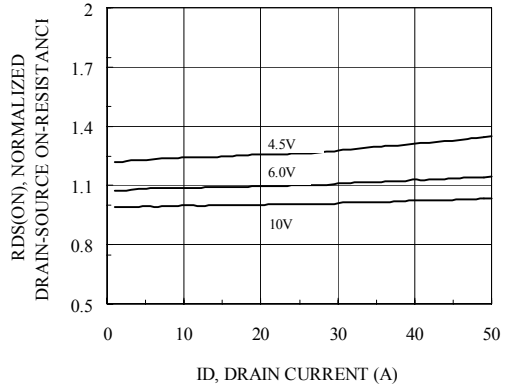


Figure 2. On-Resistance with Drain Current

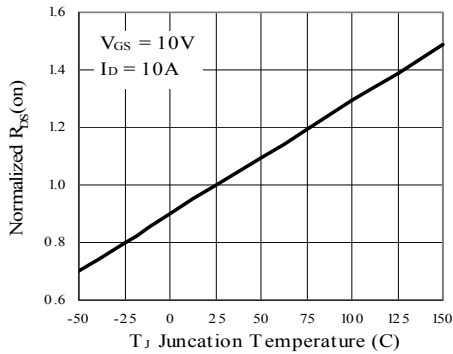


Figure 3. On-Resistance Variation with Temperature

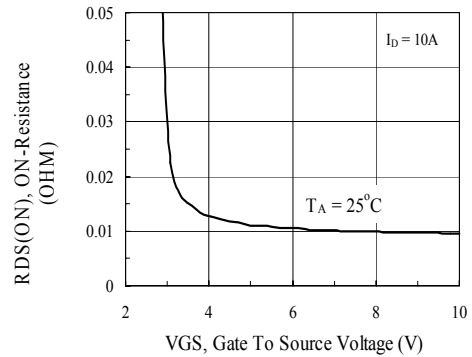


Figure 4. On-Resistance Variation with Gate to Source Voltage

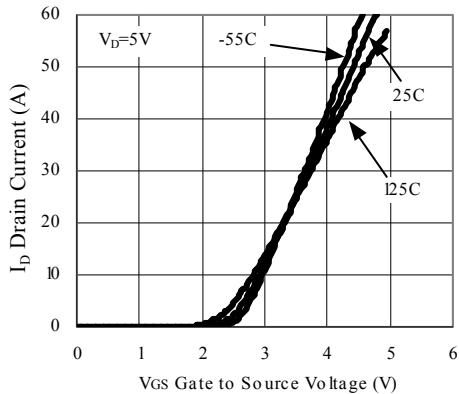


Figure 5. Transfer Characteristics

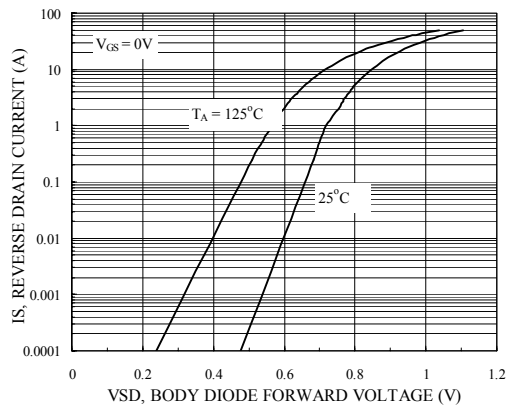


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics (N-Channel)

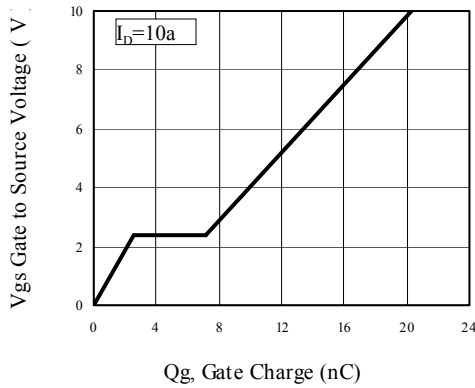


Figure 7. Gate Charge Characteristics

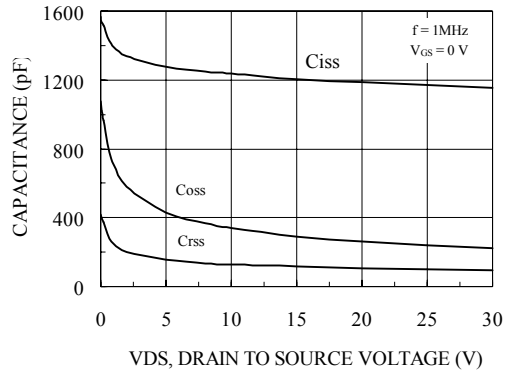


Figure 8. Capacitance Characteristics

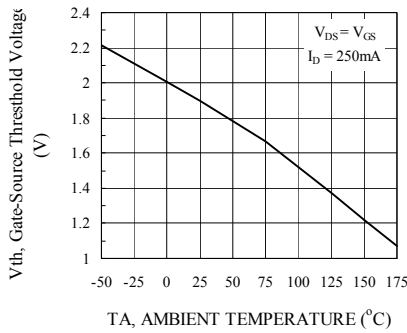


Figure 9. Threshold Vs Ambient Temperature

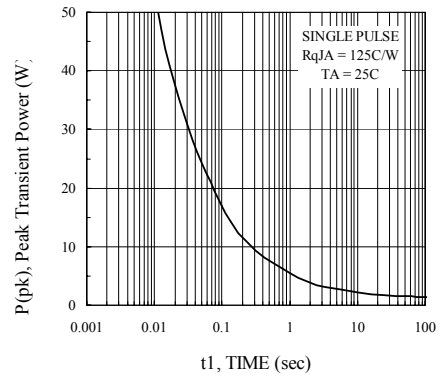


Figure 10. Single Pulse Maximum Power Dissipation

### Normalized Thermal Transient Junction to Ambient

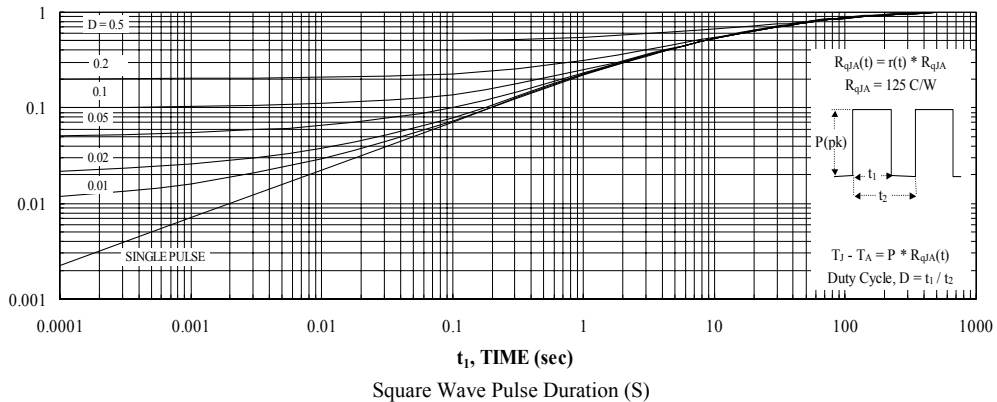
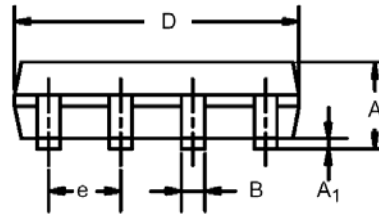
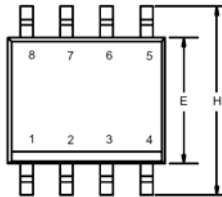


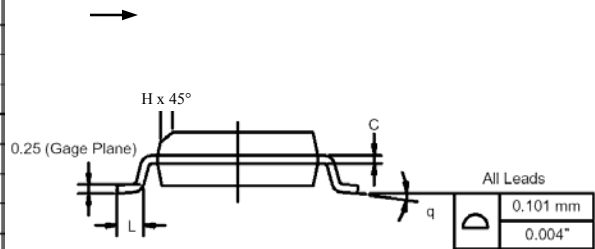
Figure 11. Transient Thermal Response Curve

Package Information

SO-8: 8LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°



# Ordering information

- AM4502CE-T1-XX
  - A: Analog Power
  - M: MOSFET
  - 4502: Part number
  - C: Complementary
  - E: ESD Protected
  - T1: Tape & reel
  - XX: Blank: Standard  
PF: Leadfree