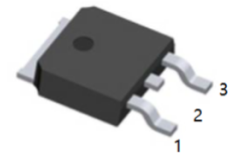


**PRODUCT SUMMARY**

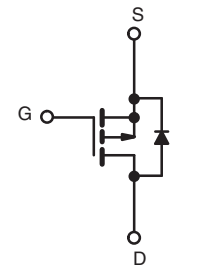
- $V_{DS} (V) = -40V$
- $R_{DS(ON)} < 17 m\Omega$  ( $V_{GS} = -10V$ )
- $R_{DS(ON)} < 28m\Omega$  ( $V_{GS} = -4.5V$ )

**FEATURES**

- Package with low thermal resistance



1.G 2.D 3.S  
TO-252(DPAK) top view



P-Channel MOSFET

**ABSOLUTE MAXIMUM RATINGS** ( $T_C = 25\text{ }^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT	
Drain-Source Voltage	$V_{DS}$	-40	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current	$I_D$	$T_C = 25\text{ }^\circ\text{C}^a$	-50	
		$T_C = 125\text{ }^\circ\text{C}$	-39	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-50	A	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-200		
Single Pulse Avalanche Current	$I_{AS}$	-40		
Single Pulse Avalanche Energy	$E_{AS}$	L = 0.1 mH	80	mJ
Maximum Power Dissipation <sup>b</sup>			$P_D$	
		$T_A = 25\text{ }^\circ\text{C}$	136	
		$T_C = 25\text{ }^\circ\text{C}$	45	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to +175	$^\circ\text{C}$	

**THERMAL RESISTANCE RATINGS**

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	$R_{thJA}$	50	$^\circ\text{C/W}$
Junction-to-Case (Drain)			

**Notes**

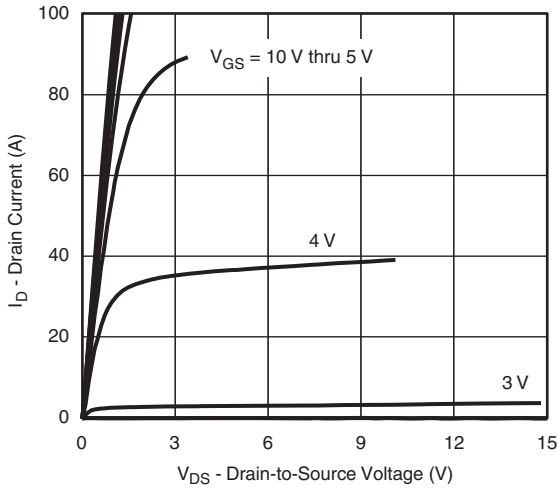
- Package limited.
- Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- When mounted on 1" square PCB (FR4 material).
- Parametric verification ongoing.

<b>SPECIFICATIONS</b> ( $T_C = 25\text{ }^\circ\text{C}$ , unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-40			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.5		-2.5	
Gate-Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}, V_{DS} = -40\text{ V}$			-1	$\mu\text{A}$
		$V_{GS} = 0\text{ V}, V_{DS} = -40\text{ V}, T_J = 125\text{ }^\circ\text{C}$			-50	
		$V_{GS} = 0\text{ V}, V_{DS} = -40\text{ V}, T_J = 175\text{ }^\circ\text{C}$			-150	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{GS} = -10\text{ V}, V_{DS} \leq -5\text{ V}$	-50			A
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -17\text{ A}$			17	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -14\text{ A}$			29	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -17\text{ A}$		61	-	S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		2872	3950	$\text{pF}$
Output Capacitance	$C_{oss}$			508	635	
Reverse Transfer Capacitance	$C_{rss}$			352	440	
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{GS} = -10\text{ V}, V_{DS} = -30\text{ V}, I_D = -50\text{ A}$		60	80	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			5.7	8.6	
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			14.7	22	
Gate Resistance	$R_g$	$f = 1\text{ MHz}$	1.5	3	4.5	$\Omega$
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -20\text{ V}, R_L = 0.4\text{ }\Omega, I_D \cong -50\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		10	15	ns
Rise Time <sup>c</sup>	$t_r$			12	18	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			40	60	
Fall Time <sup>c</sup>	$t_f$			16	24	
<b>Source-Drain Diode Ratings and Characteristics<sup>b</sup></b>						
Pulsed Current <sup>a</sup>	$I_{SM}$				-200	A
Forward Voltage	$V_{SD}$	$I_F = -50\text{ A}, V_{GS} = 0\text{ V}$		-1	-1.5	V

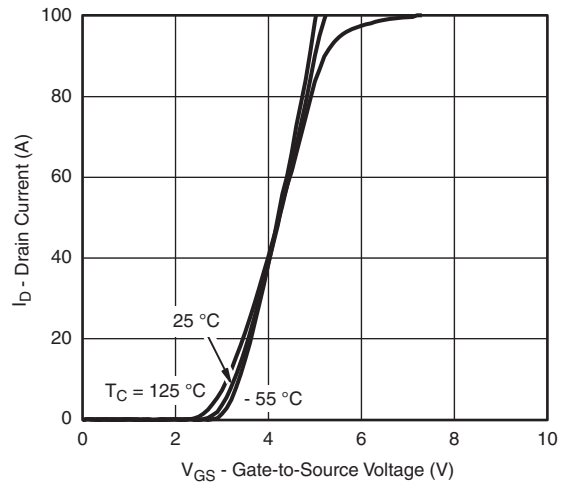
### Notes

- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

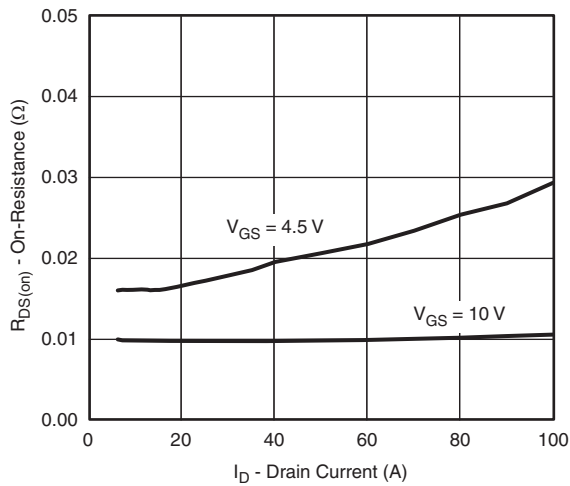
**TYPICAL CHARACTERISTICS** ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



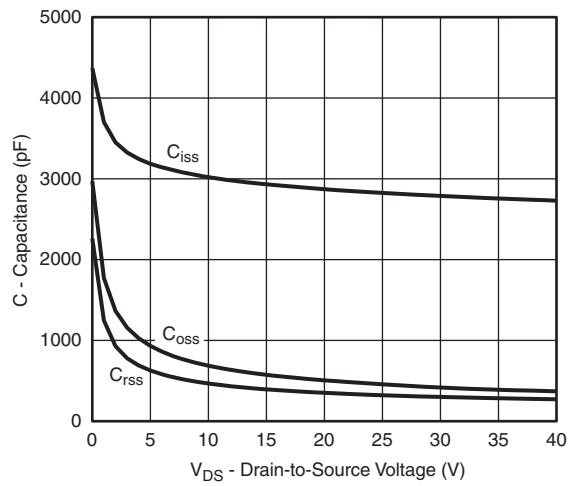
**Output Characteristics**



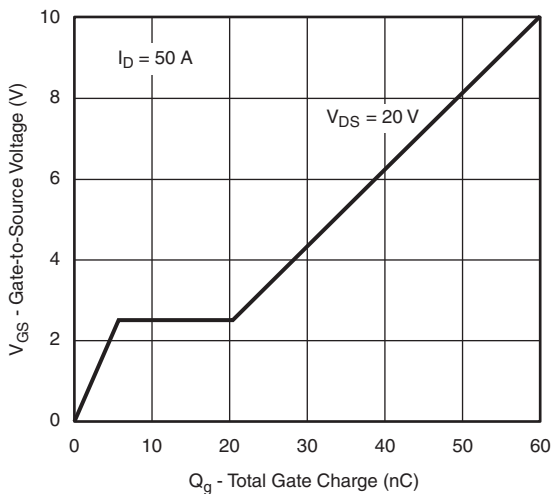
**Transfer Characteristics**



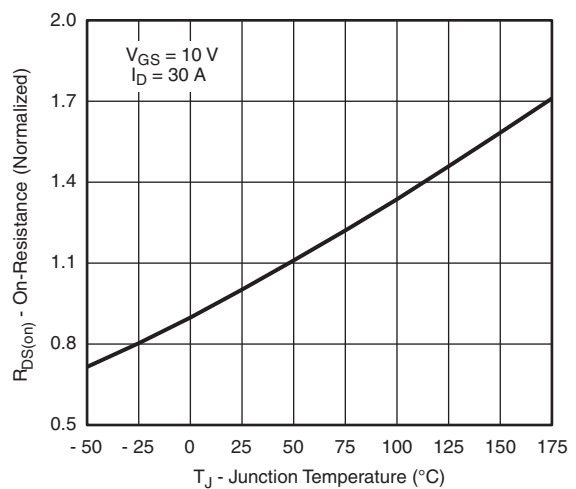
**On-Resistance vs. Drain Current**



**Capacitance**

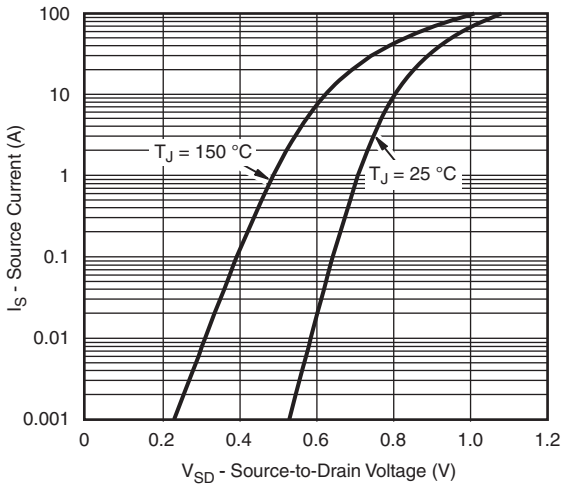


**Gate Charge**

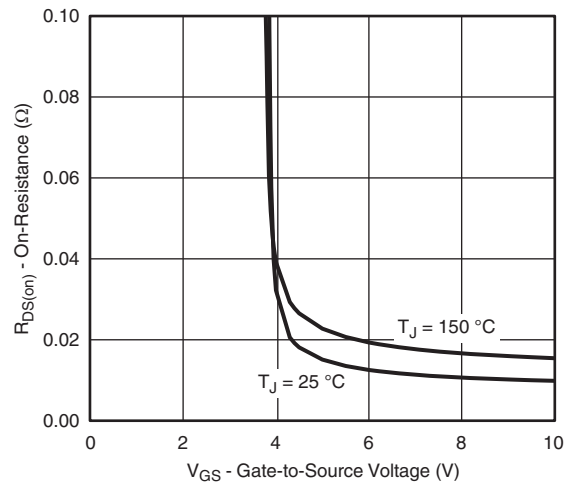


**On-Resistance vs. Junction Temperature**

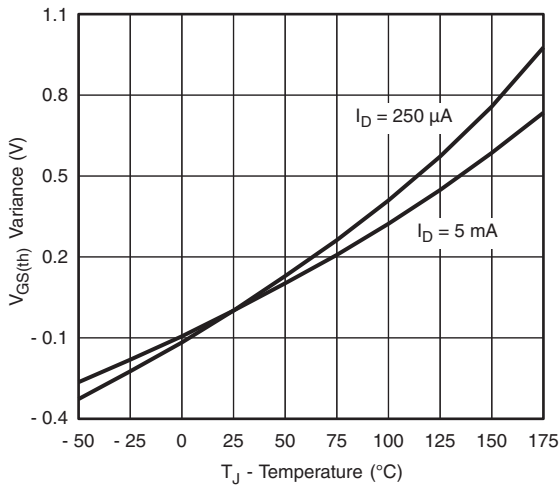
**TYPICAL CHARACTERISTICS** ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



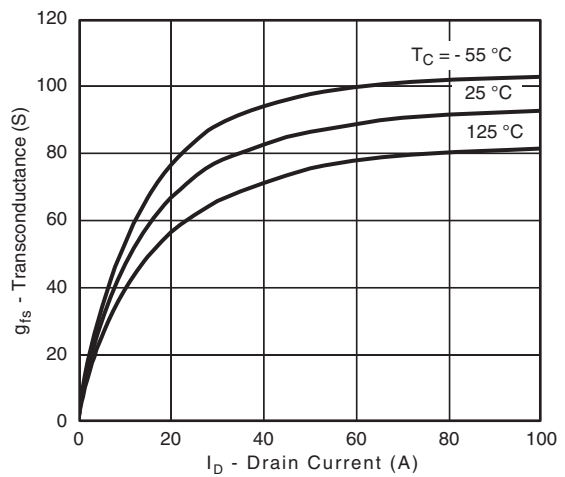
**Source Drain Diode Forward Voltage**



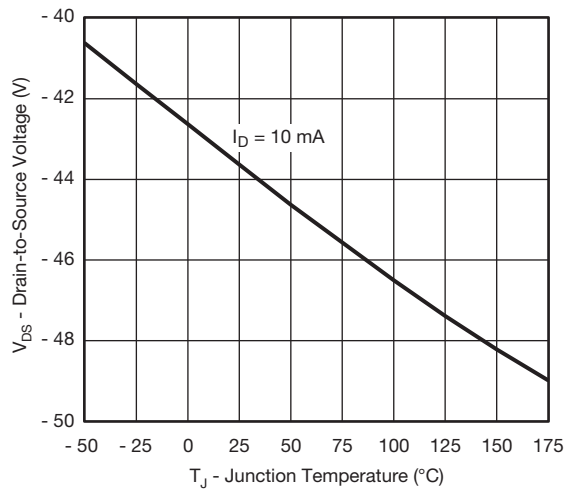
**On-Resistance vs. Gate-to Source Voltage**



**Threshold Voltage**

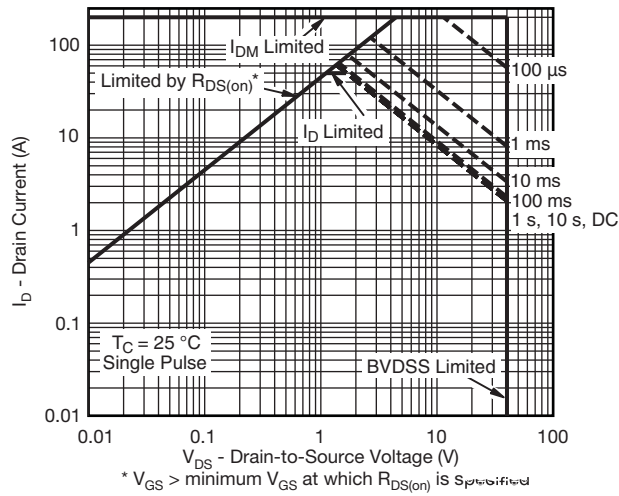


**Transconductance**

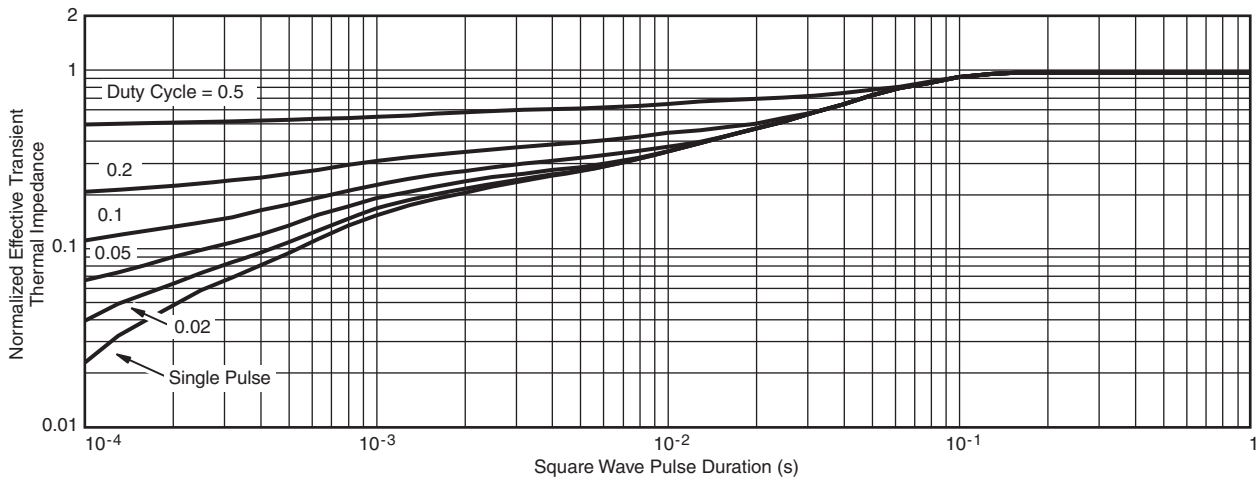


**Drain Source Breakdown vs. Junction Temperature**

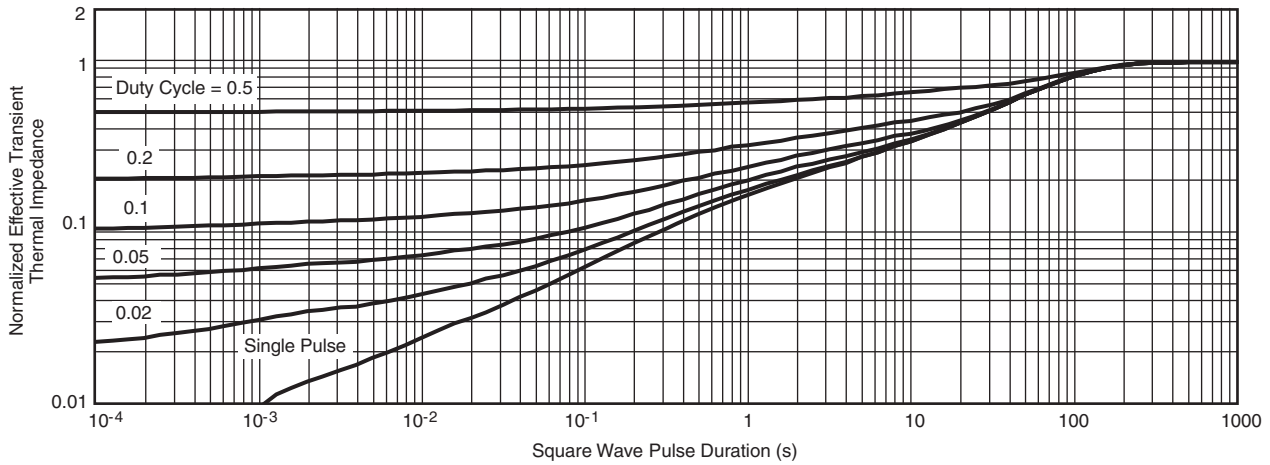
**TYPICAL CHARACTERISTICS** ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



**Safe Operating Area**



**Normalized Thermal Transient Impedance, Junction-to-Case**

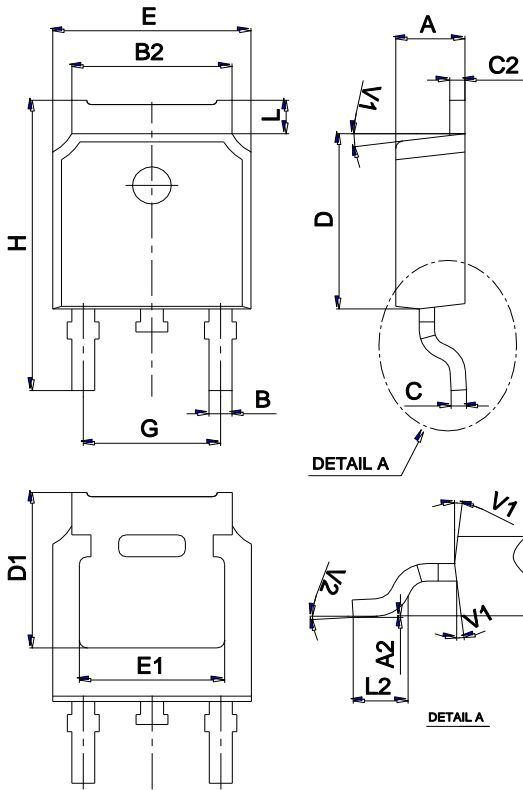


**Normalized Thermal Transient Impedance, Junction-to-Ambient**

**Note**

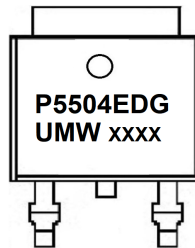
- The characteristics shown in the two graphs
    - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
    - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)
- are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW P5504EDG	TO-252	2500	Tape and reel